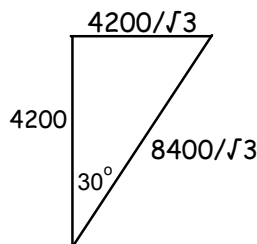


Precalc Warm Up # 11-1

Jackie runs in a direction N 30° E and after 50 minutes finds herself 4200 meters north of her starting position. What is her speed in ms^{-1} ?

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$$\frac{8400 \text{ meters}}{\sqrt{3} \cdot 50 \text{ min}} \cdot \frac{\text{min}}{60 \text{ sec}} = \frac{8400 \text{ meters}}{3000\sqrt{3} \text{ sec}} = \frac{14 \text{ meters}}{5\sqrt{3} \text{ sec}} = \frac{14\sqrt{3} \text{ m}}{15 \text{ s}} \approx 1.62 \text{ ms}^{-1}$$

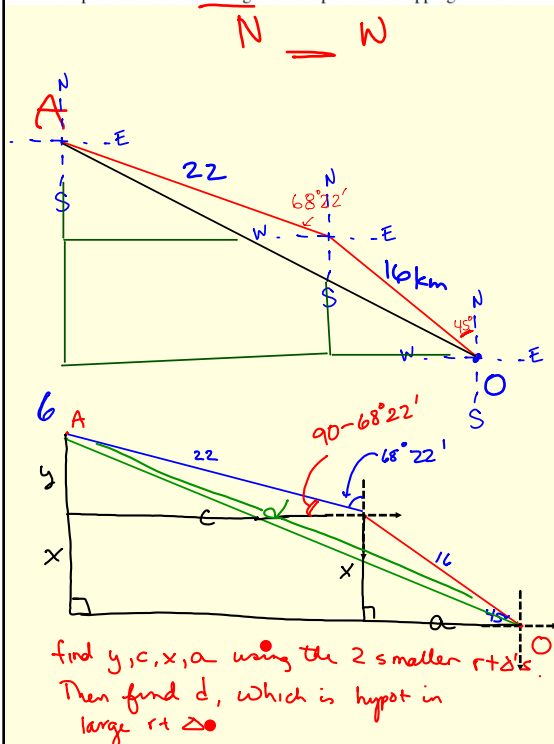
EXERCISES 9.2

1. (a) Change the following compass bearings into true bearings
i. $N30^{\circ}E$ ii. $N30^{\circ}W$ iii. $S15^{\circ}W$ iv. $W70^{\circ}S$
(b) Change the following true bearings into compass bearings
i. $025^{\circ}T$ ii. $180^{\circ}T$ iii. $220^{\circ}T$ iv. $350^{\circ}T$

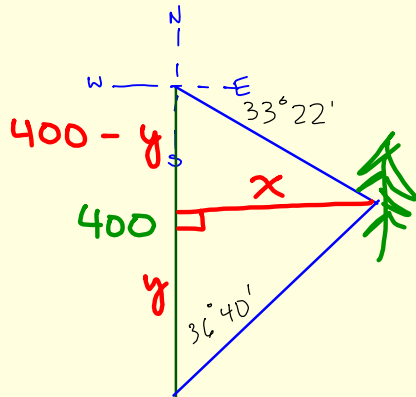
3. From a point A on the ground, the angle of elevation to the top of a tree is 52° . If the tree is 14.8 m away from point A, find the height of the tree.

5. Patrick runs in a direction $N60^\circ E$ and after 45 minutes finds himself 3900 m North of his starting point. What is Patrick's average speed in ms^{-1} .

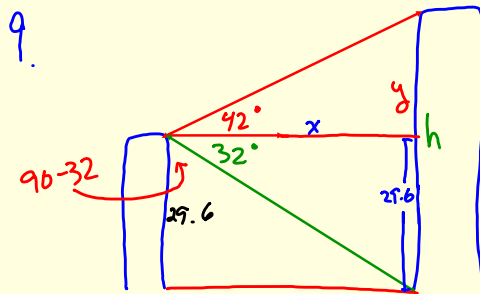
6. A ship leaves Oldport and heads NW. After covering a distance of 16 km it heads in a direction of $N68^\circ 22' W$ travelling a distance of 22 km where it drops anchor. Find the ship's distance and bearing from Oldport after dropping anchor.



7. From two positions 400 m apart on a straight road, running in a northerly direction, the bearings of a tree are $N36^\circ40'E$ and $E33^\circ22'S$. What is the shortest distance from the tree to the road?



9. From a window, 29.6 m above the ground, the angle of elevation of the top of a building is 42° , while the angle of depression to the foot of the building is 32° . Find the height of the building.
10. Two towns P and Q are 50 km apart, with P due west of Q. The bearing of a station from town P is $040^\circ T$ while the bearing of the station from town Q is $300^\circ T$. How far is the station from town P?

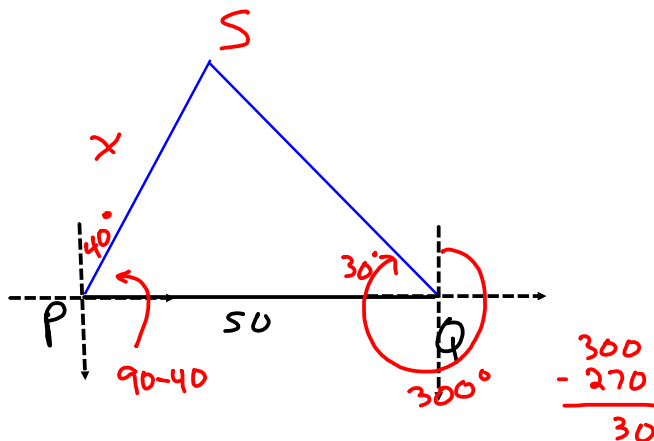


find x

Then find y

The height is
 $y + 29.6$

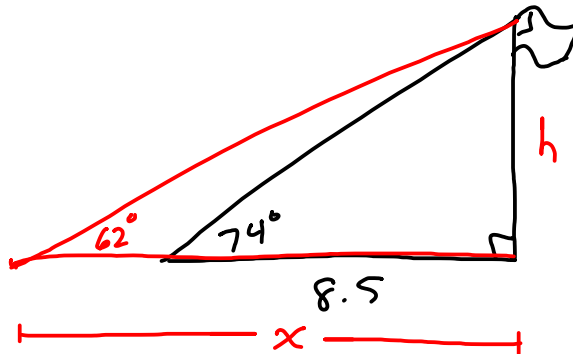
10.



find x
(drop an altitude from S)

- 11.** When the sun is 74° above the horizon, a vertical flagpole casts a shadow 8.5 m onto a horizontal ground. Find the shadow cast by the sun when it falls to 62° above the horizontal.

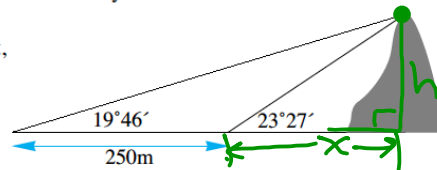
11.



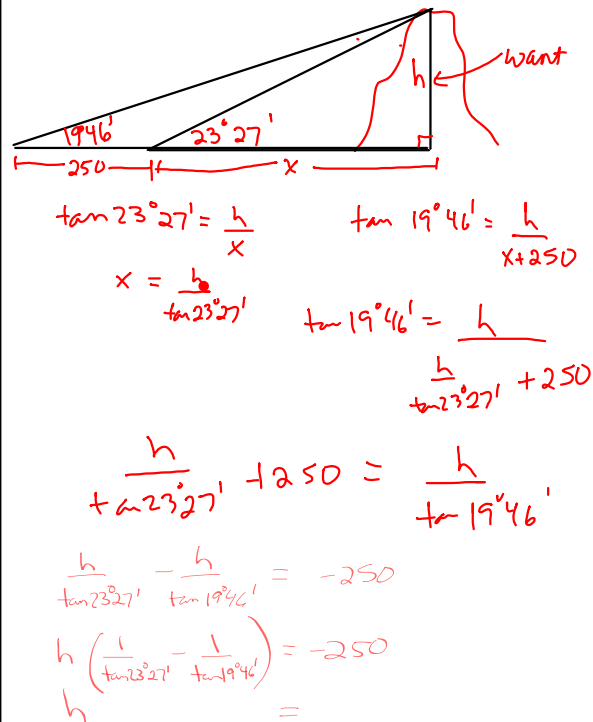
find h
using
the smaller
 Δ .

Then get x
in the bigger
one

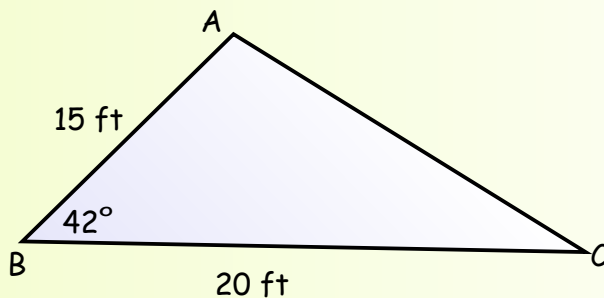
- 13.** A surveying team are trying to find the height of a hill. They take a 'sight' on the top of the hill and find that the angle of elevation is $23^\circ 27'$. They move a distance of 250 metres on level ground directly away from the hill and take a second 'sight'. From this point, the angle of elevation is $19^\circ 46'$. Find the height of the hill, correct to the nearest metre.



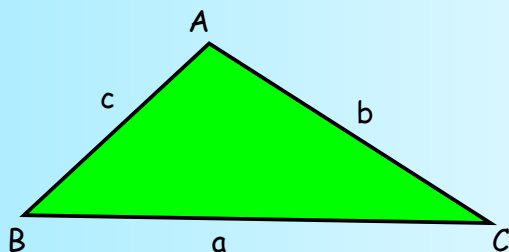
13.



Find the area of the triangle below. Use 20 ft for the base, drop an altitude from A and call it h for height. Find h . Then find area of the triangle.

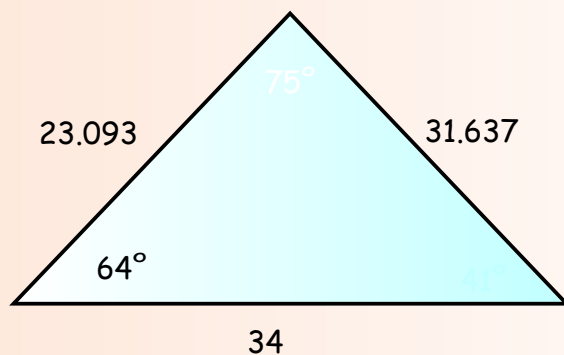


Find a formula for the area of a non right triangle in terms of 2 sides and the included angle.



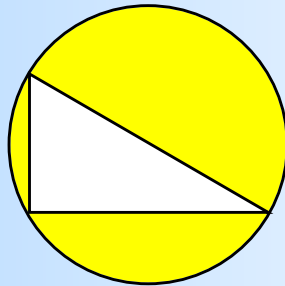
$$\begin{aligned}\text{AREA} &= (1/2) ab \sin C \\ &= (1/2) ac \sin B \\ &= (1/2) bc \sin A\end{aligned}$$

Find the area of the triangle to the nearest 10th.

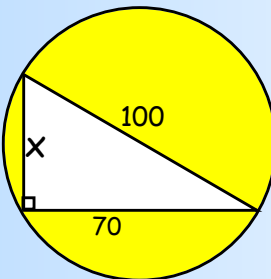


$$\approx 352.8$$

A triangle is inscribed in a circle in such a way that one of the sides is a diameter of the circle. If the radius of the circle is 50 ft and one of the triangle's sides is 70, find the yellow area. (to nearest tenth)



5354.5



$$x^2 + 70^2 = 100^2$$

$$x = 100^2 - 70^2$$

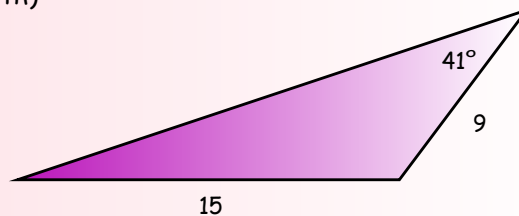
$$x \approx 71.4$$

$$\text{Yellow Area} = \text{Area Circle} - \text{Area Triangle}$$

$$= \pi 50^2 - (1/2)(x)(70)$$

$$\approx 5354.5 \text{ ft}^2$$

Find the area of the triangle below
(nearest 10th)



need a + b

$$\cos 41 = a/9$$

$$a = 9 \cos 41$$

$$\sin 41 = h/9$$

$$h = 9 \sin 41$$

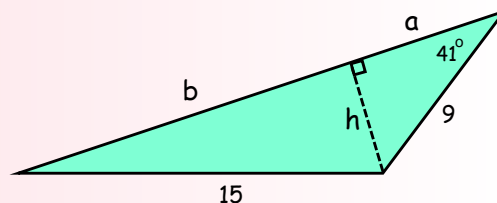
$$b^2 + h^2 = 15^2$$

$$b^2 + (9 \sin 41)^2 = 225$$

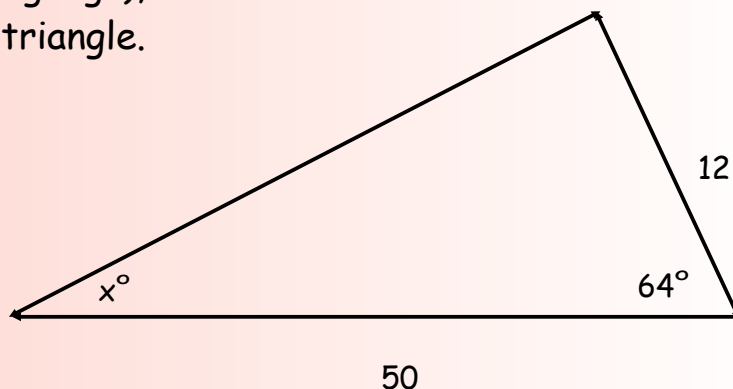
$$b = \sqrt{225 - (9 \sin 41)^2}$$

$$A = (1/2)(9 \cos 41 + \sqrt{225 - (9 \sin 41)^2})(9 \sin 41)$$

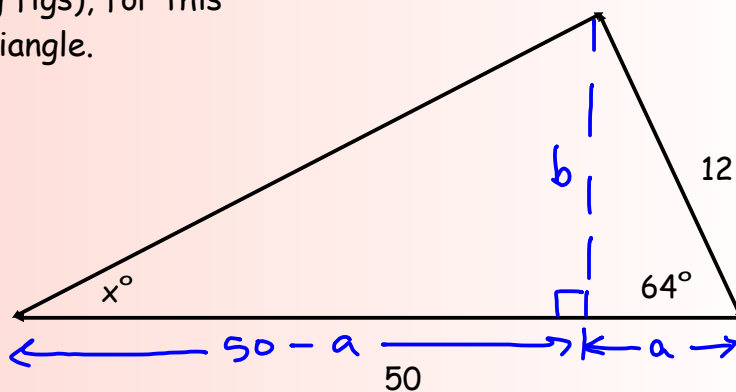
$$\approx 60.8$$



Find x (3 sig figs), for this non-right triangle.



Find x (3 sig figs), for this non-right triangle.



$$\cos 64^\circ = \frac{a}{12}$$

$$12 \cos 64^\circ = a$$

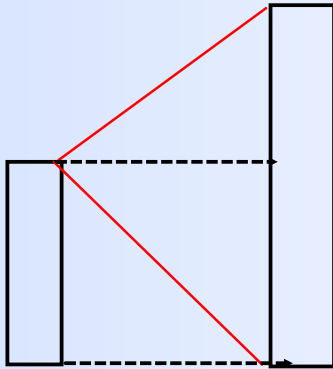
$$\sin 64^\circ = \frac{b}{12}$$

$$12 \sin 64^\circ = b$$

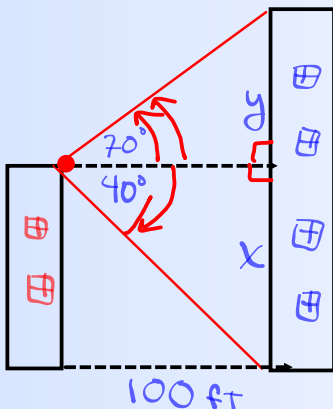
$$\tan x = \frac{12 \sin 64^\circ}{50 - 12 \cos 64^\circ}$$

$$x \approx 13.6^\circ$$

Two buildings are 100 ft apart. A person standing on top of the shorter building looks up with an angle of elevation of 70° to the top of the taller building. They look down with an angle of depression of 40° to the bottom of the taller building. How tall is the taller building? Answer to the nearest tenth of a foot.



Two buildings are 100 ft apart. A person standing on top of the shorter building looks up with an angle of elevation of 70° to the top of the taller building. They look down with an angle of depression of 40° to the bottom of the taller building. How tall is the taller building? Answer to the nearest tenth of a foot.



$$\tan 40 = x/100$$

$$x = 100 \tan 40$$

$$\tan 70 = y/100$$

$$y = 100 \tan 70$$

$$100 \tan 40 + 100 \tan 70 \approx 358.7$$

HW: SL book, p. 288

#1 ade, 2-9 skip 6

#7 has 2 answers. Try
to find the one that is
not given in the back of
the book!